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Abstract

The invention relates to a method and a device for joining together profiled sections, preferably profiled sections which form part of an electric-cable ducting system. The profiled sections (2, 14, 15) are provided with at least one T-groove in which a joining device (1) is intended to be placed so that the device will bridge the join location upon completion of the join. The inventive joining device (1) comprises a rail or bar of slightly V-shape cross-section. The device has a bend-facilitating weakening (10) extending along the apex of the V, and the side edges (6, 7) of the device are configured for engagement with the side edges (4, 5) of the T-groove and also to form spacer means (8, 9) which enable the joining device (1) to be flattened and flipped over. As a result of the toggle-joint effect engendered, a relatively small pressure on the bend-facilitating weakening will cause the device to expand outwardly against the side edges (6, 7) of the T-groove with great force, such as to lock the profiled sections (2, 14, 15) effectively to one another.

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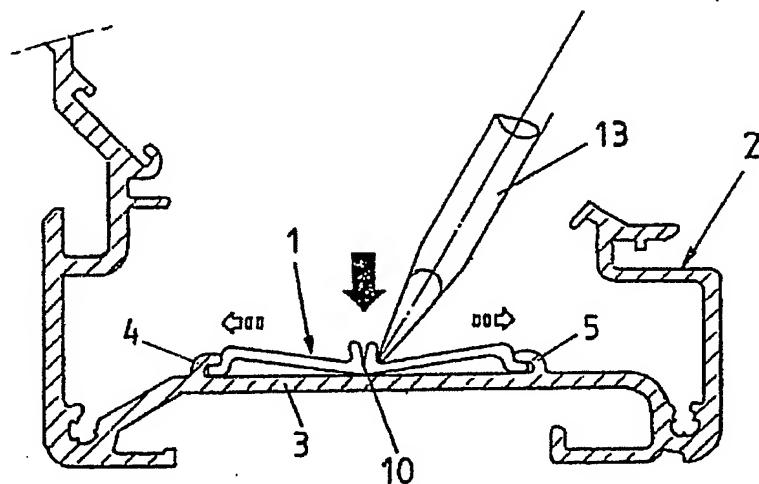
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<p>(21) International Application Number: PCT/SE88/00131 (22) International Filing Date: 15 March 1988 (15.03.88)</p> <p>(31) Priority Application Number: 8701070-8 (32) Priority Date: 16 March 1987 (16.03.87) (33) Priority Country: SE</p> <p>(71) Applicant (<i>for all designated States except US</i>): THORSMAN & CO AB [SE/SE]; Box 149, S-611 24 Nyköping (SE).</p> <p>(72) Inventor; and (75) Inventor/Applicant (<i>for US only</i>): OLOFSSON, Roland, Erik [SE/SE]; Västra Trädgårdsgatan 46, S-611 32 Nyköping (SE).</p> <p>(74) Agent: BAUMBACH, Thorkild; Ankavägen 4, S-761 00 Norrtälje (SE).</p>		<p>(81) Designated States: CH (European patent), DE (European patent), DK, FI, FR (European patent), GB (European patent), IT (European patent), NL (European patent), NO, US.</p> <p>Published <i>With international search report. In English translation (filed in Swedish).</i></p>

(54) Title: A PROFILED SECTION JOINING DEVICE



(57) Abstract

The invention relates to a method and a device for joining together profiled sections, preferably profiled sections which form part of an electric-cable ducting system. The profiled sections (2, 14, 15) are provided with at least one T-groove in which a joining device (1) is intended to be placed so that the device will bridge the join location upon completion of the join. The inventive joining device (1) comprises a rail or bar of slightly V-shape cross-section. The device has a bend-facilitating weakening (10) extending along the apex of the V, and the side edges (6, 7) of the device are configured for engagement with the side edges (4, 5) of the T-groove and also to form spacer means (8, 9) which enable the joining device (1) to be flattened and flipped over. As a result of the toggle-joint effect engendered, a relatively small pressure on the bend-facilitating weakening will cause the device to expand outwardly against the side edges (6, 7) of the T-groove with great force, such as to lock the profiled sections (2, 14, 15) effectively to one another.

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A PROFILED SECTION JOINING DEVICE

The present invention relates to a method and a device for joining together profiled sections, preferably such beam-like profiles of the kind intended for electric-cable ducting or channeling systems and including at least one T-groove into which there is meant to be fitted a profiled-section joining member in a manner such as to bridge the join location when joining of two such profiled sections is complete.

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BACKGROUND PRIOR ART

The extrusion of profiled sections from both metal and plastics is being applied increasingly and has resulted in increased use of profiled sections for the most widely diverse purposes and within widely separated fields. In addition, the cross-sectional shapes of such profiles have become progressively more complicated. One area in which the use of profiled sections has increased is that of laying or installing electric cables and telecommunication cables. To this end beam-like profiles have been developed in which electric cables can be protected against electrical disturbances and against damage from external sources. Irrespective of the use for which the profiles are intended, there is normally a need to be able to join different profiles together easily, and primarily in their longitudinal direction. In order to enable these profiles to be joined together more easily, the profiles are often provided with T-grooves into which joining devices are fitted, these devices covering the area of the completed join. The joining device normally has the form of a rail of rectangular section, which is first inserted into a T-groove on one profiled section so as to extend partially into a corresponding T-groove in the other profiled section when the profiled sections are brought together with the respective profiled shapes coinciding.

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Various methods have been devized for locking the joining device in its join-bridging position. One method involves providing the device with screw-threaded holes in which stop screws are screwed against the bottom of the T-groove, to prevent the joining device from moving in relation to the T-grooves. According to another method the joining device is provided with mutually overlapping slots which extend from the short ends of the device, these slots causing the joining device to abut the outer sides of the T-groove under a powerful spring force when inserting the device into a T-groove. According to another method, the joining device is provided with a longitudinally extended corrugated or pleated centre part made of spring steel or like material, which also brings the joining device into powerful abutment with the outer sides of the T-groove.

One feature common to known joining devices of this kind is that in order to join the sections together, the devices must be placed first in the T-groove of one section and then, after bringing the profiled sections together, must be moved through half of its length into the corresponding T-groove of the other profiled section. When the joining device is of the kind provided with stop screws, one of the screws is tightened down when the joining device is first placed in the groove of one section, in order to prevent the device from falling out of the groove while manipulating the profiled section concerned. When the sections have been positioned, any screw which has been tightened is unscrewed and the joining device is moved through half its length into the other section, whereafter all stop screws are finally screwed down. When the joining device is positioned within the contours of a beam-like profiled section, the task of sliding the device and tightening the screws can be difficult and time-consuming. Still more difficulty is found in sliding or displacing a joining device of the kind which is in spring-abutment with

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the outer sides of the T-shaped grooves, since the device often moves so tightly in the grooves that it is necessary to use a hammer to position the device correctly, the suspension devices of the sections being subjected herewith to stresses 5 of a kind from a direction for which they are not constructed.

A further drawback with the known joining devices is that the fitter repeatedly forgets to place in position the device or devices required to effect a join in one of the profiled 10 sections. This omission is first noticed when the profiled sections are in position and joining of the sections is to be completed, by attaching the ends of the sections together with the aid of the joining device. The fitter then either neglects to use a joining device and trusts that suspension 15 of the profiled sections will in itself be sufficiently stable to prevent mutual displacement of the sections, or accepts the consequences of his forgetfulness and dismantles one section to the extent required, so that the requisite joining device can be inserted into the T-groove concerned.

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SUMMARY OF THE INVENTION

The object of the invention is to provide for the purpose of joining together profiled sections a method and a device which 25 are not encumbered with the drawbacks associated with the known methods and devices. This object is achieved with the method and the joining device according to the invention, which is concerned preferably with joining together profiled sections which form part of an electric-cable ducting or channelling 30 system. The characteristic features of the invention are set forth in the following claims.

BRIEF DESCRIPTION OF THE DRAWINGS

35 The invention will now be described with reference to an

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exemplifying embodiment thereof and with reference to the accompanying drawings, in which

5 Figure 1 is a sectional view of part of a profiled section provided with a T-groove and shows a joining device being fitted into the groove;

10 Figure 2 is a sectional view of the profiled section illustrated in Figure 1 with the joining device expanded in the T-groove and firmly locked;

15 Figure 3 is a perspective view of two profiled sections which form part of an electric-cable ducting system and which have been joined together by means of a joining device shown expanded in the groove and bridging over the join location; and

20 Figure 4 illustrates in perspective the end part of a profiled section forming part of an electric-cable ducting system and shows an unexpanded joining device in one of the T-grooves of the section.

DESCRIPTION OF A PREFERRED EMBODIMENT

25 Figure 1 shows a joining device 1 being fitted into the T-groove or channel of a profiled section 2, the T-groove comprising a groove bottom which consists of a flat section-part 3 defined laterally by legs 4, 5 the edges of which are folded inwardly such as to mutually face one another.

30 The joining device, or connector, comprises a slightly V-shaped rail or bar having provided at the apex of the V a bend-facilitating weakening 10 formed by thinning the rail at this location. The side edges 6, 7 are bent into the 35 shape of an S, so as to enable said edges to be brought into

engagement with the edges of the legs of the T-groove while at the same time forming spacers 8, 9. The joining device 1 need not be slid into the T-groove through the groove mouth, by first bringing one side edge 7 into engagement with the groove leg 5, as shown in Figure 1, and then twisting or rotating the joining device in the direction of the arrow, past the groove leg 4 and into abutment with the groove bottom 3. Thus, joining the device 1 can be positioned over a joining location subsequent to bringing the profiled sections in end-to-end contact.

Figure 2 illustrates how the joining device 1 is expanded so as to be locked in the groove, subsequent to having placed the device 1 into the T-groove of the profiled section 2. This is achieved by flattening the initially V-shaped joining device 1 and causing the device to flip over inwardly, along the weakening 10, by applying pressure adjacent said weakening, for instance with the aid of a screwdriver 13. The weakening 10 has located on respective sides thereof stiffening strips 11, 12 which facilitate correct positioning of the screwdriver on the joining device and also distribute the pressure applied along the weakening 10. Due to the toggle-joint effect occurring when the joining device is flattened, the force at which the edges of the device engage the edges of the T-groove will be many times greater than the force exerted by means of the screwdriver. In order to loosen the joining device subsequent to locking the same in the T-groove, it is necessary to insert a screwdriver or like tool beneath the device and restore the device to its original V-shape.

Figure 3 illustrates in perspective two beam-like profile sections 14, 15 forming part of an electric-cable ducting system and joined together by means of a joining device 1 which has been passed through the common front opening of

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the sections and placed in a T-groove located in the bottom wall of respective beams and expanded in the groove by means of a light hammer-blow on the screwdriver 13.

- 5 Figure 5 illustrates in perspective the end part of a profiled section 16 forming part of an electric-cable ducting system and shows an unexpanded joining device 1 partially inserted into one T-groove 4, 5 of the profiled section. Large profiled sections will be suitably provided with several
- 10 T-grooves and the reference 17 in Figure 4 illustrates an additional T-groove. Electric-cable ducting systems of the kind illustrated in the figure will also include cover plates, and one such cover plate is referenced 18 in Figure 4.
- 15 It will be understood that the invention is not restricted to joining together profile sections of the aforescribed kind or for the described purpose, and that both the configuration of the profile and the configuration of the joining device can be varied within the scope of the invention.
- 20 For example, the legs 4, 5 which define the T-grooves laterally may be slightly higher than those illustrated and the profile section may be provided with spacer strips positioned in the T-groove adjacent said legs. This modification obviates the need for spacers on the joining device,
- 25 which may then comprise a simple, angled plate the side edges of which will rest on the spacer strips when the device is placed in the T-groove, and can be expanded and pressed or folded inwardly. Those savings made on the joining device when practicing this alternative embodiment do not
- 30 compensate for the greater cost of the profile sections, and hence the embodiment first described is preferred.

- 35 The joining device may also be used to fixate profiled sections relative to one another prior to welding the sections together or joining said sections by some other means.

CLAIMS

1. A method for joining together profiled sections in end-to-end relationship, preferably beam-like profiled sections
5 forming part of an electric cable ducting system, said sections including at least one T-groove in which a joining device is intended to be fitted in a manner to bridge the joining location upon completion of the join, characterized by bringing the profiled sections (2, 24, 15) in end-to-end abutment
10 such that the contours of the profile coincide: placing in the T-groove a joining device (1) which has the form of a rail or bar and which in its non-fitted state has a slightly V-shaped cross-sectional shape, and which has a bend-facili-
15 tating weakening (10) located along the apex of the V and presents side edges (6, 7) configured to engage the side edges (4, 5) of the T-groove and also to form spacer means (8, 9) which enable the device (1) to be flattened and pressed inwards at the join location; and by applying pressure to the joining device in a manner such as to flatten and expand
20 said device against the edges (4, 5) of the T-groove while simultaneously locking the profiled sections (2, 14, 15) one to the other.
2. A joining device (1) for carrying out the method accord-
25 to Claim 1, characterized in that the device consists of a rail or bar which in its non-fitted state is slightly V-shaped in cross-section and has a bend-facilitating weaken-
30 ing (10) along the apex of the V, and further having side edges (6, 7) which are configured so as to engage the side edges (4, 5) when fitted into a T-groove and to form spacer means (8, 9) which enable the joining device (1) to be flat-
35 tened and flipped over, thereby causing the device (1) to expand outwardly against the side edges (4, 5) of the T-groove while at the same time flipping-over the central part of the device (1) so as to lock said device in the T-groove.

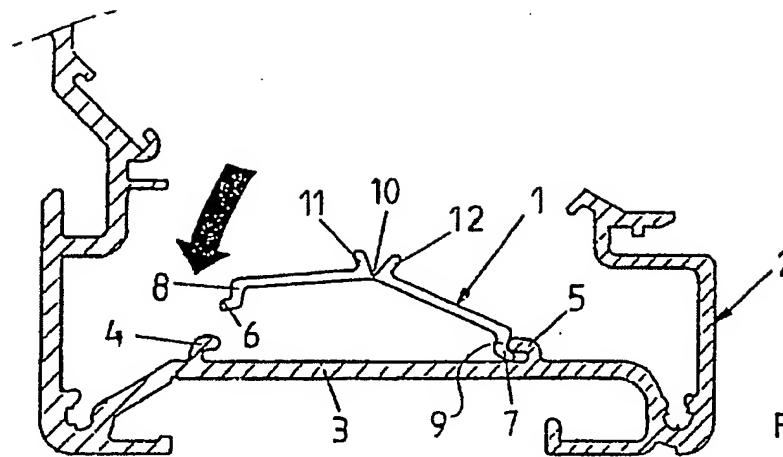


Fig. 1

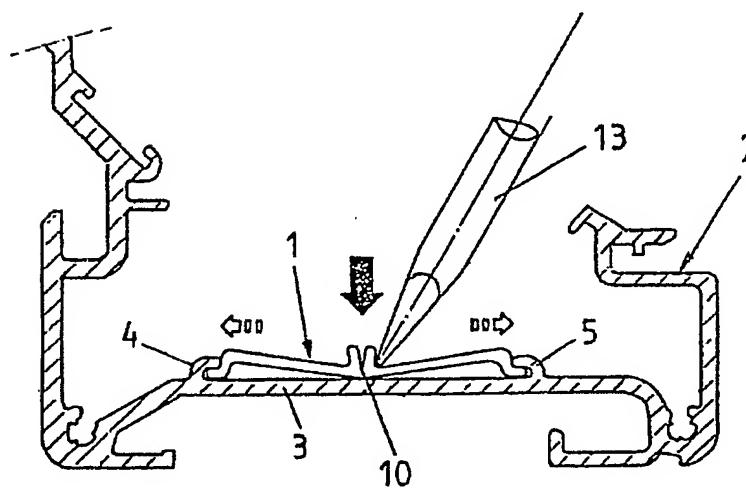


Fig. 2

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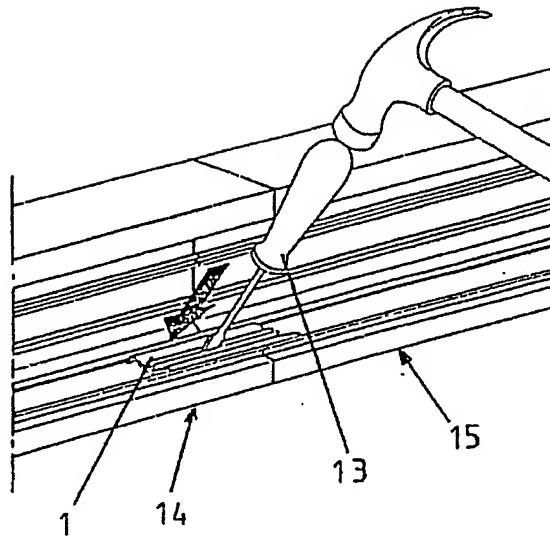


FIG. 3

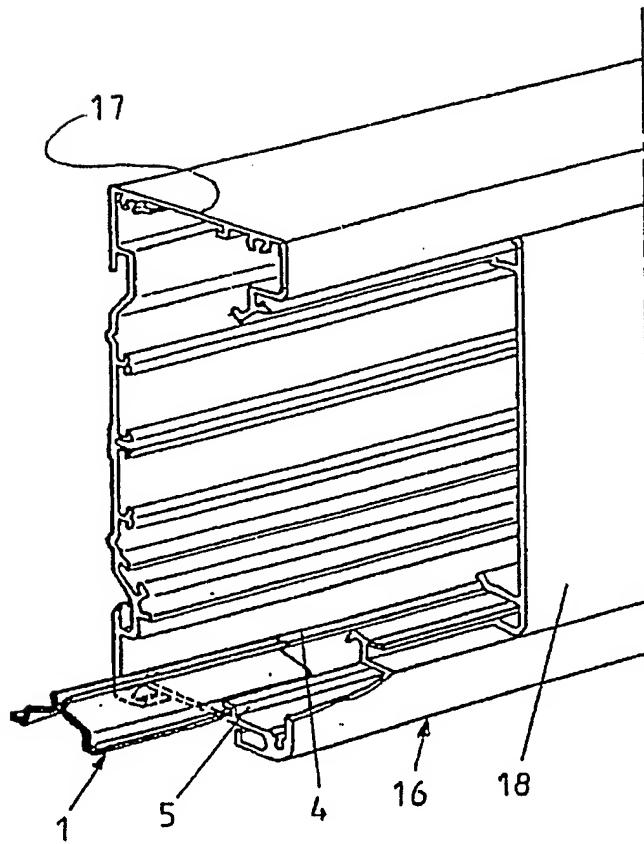


FIG. 4

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INTERNATIONAL SEARCH REPORT

PCT/SE88/00131

International Application No.

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) *

According to International Patent Classification (IPC) or to both National Classification and IPC 4

H 02 G 3/06

II. FIELDS SEARCHED

Minimum Documentation Searched ?

Classification System	Classification Symbols
IPC 4	H 02 G 3/04, /06
Nat Cl	21c:18/01
US Cl	174:49, 68, 95-98

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched *

SE, NO, DK, FI classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT*

Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages †‡	Relevant to Claim No. 13
A	DE, A1, 3 139 287 (STAGO ELECTROTECHNIEK B.V.) 16 June 1982	1, 2

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IV. CERTIFICATION

Date of the Actual Completion of the International Search

1988-05-11

Date of Mailing of this International Search Report

1988 -06- 06

International Searching Authority

Swedish Patent Office

Signature of Authorized Officer,

Magnus Westöö

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